

**Project Number:** VLE883

**Project Title:** Agricultural Safety Promotion System

**Division:** DSR

**Project Officer (PO):** David L. Hard

**PO Degree:** Doctoral

**PO Area of Expertise (scientific discipline):** Health Education

**Project Start Date:** 10/1/1995

**Project End Date:** 9/30/1997

**Total Budget over the Project Period:** \$1,000,000 (An estimated 2,000,000 was spent on this project between 1995 and 1996 related to the agriculture industry).

**Goal/Sub-Goal:**

Goal, Health Promotion Systems: To reduce injuries and illnesses of workers in the agriculture, forestry, and fishing industrial sector by informing those who serve segments of this population of occupational safety and health hazards and control systems.

Sub-Goal, Community Intervention Evaluation: To reduce risk of exposure to agricultural hazards by demonstrating effectiveness of interventions and diffusing protective knowledge through agricultural networks to farmers and farmworkers and their families.

**Challenge/Issue:**

The agriculture industry in the United States employs approximately 3.4 million full-time workers, and with the part-time help which is often employed, it raises the total to about 7.7 million persons who are employed in agriculture. They are exposed to a wide variety of chemical, biological, and physical hazards on a daily basis. These workers have the fourth highest occupational fatal injury rate (18.3 deaths per 100,000 workers for 1980-89) and the third highest occupational nonfatal injury rate (10.2 injuries per 100 full-time workers) in the United States. Thus, agriculture is consistently ranked among the most hazardous industries. In addition, the occupation of farming is ranked among the top four hazardous occupations.

The purpose of this cooperative agreement is to stimulate agricultural safety and health intervention programs to reduce agricultural injury and/or to reduce exposure to hazards resulting in injury. A primary emphasis is the assessment of the efficacy of intervention programs. It is anticipated that this program will reduce the incidence of occupational injuries and fatalities by implementing effective intervention projects.

The project addresses the Year 2000 Objective of reducing deaths from work-related injuries to no more than 4 per 100,000 full-time workers, and the Objective of reducing significant work-related injuries to no more than 6 cases per 100 full-time workers. The project is also related to the NIOSH emphasis area of Control Technology and Intervention Research, and the NORA priority research areas of Intervention Effectiveness Research, Traumatic Injuries, and Special Population at Risk.

**Activities:**

Six land grant universities were involved in this program (Table 1). Land grant universities have an existing delivery system through the established link between the land grant universities, the county extension service agents, and the farmer. This has proven to be a reliable and cost-

effective method of providing information and training to farmers, agricultural workers, and their families. Experience with past programs has also established that it is beneficial to have NIOSH involvement with universities for effecting interventions with the agricultural population.

Table 1. Land Grant Universities funded under the ASPS.

Universities	Grant Number
University of California-Davis	U05/CCU 911435
University of Missouri-Columbia	U05/CCU 711494
Cornell University (New York)	U05/CCU 211380
North Carolina A&T State University	U05/CCU 411455
The Ohio State University	U05/CCU 506070
University of Wisconsin-Madison	U05/CCU 506065

The individual intervention projects include the following:

1. University of California-Davis: This was a study of the effectiveness of ergonomic interventions in nursery operations. Investigative tools included worker questionnaires, hazard analyses, and injury data, using a before and after study design.
2. University of Missouri-Columbia: The intervention was agricultural safety training of children, using pre- and post-testing of understanding. This was being coordinated with Future Farmers of America, and the adult teachers will also be tested as to changes in their farm safety behavior intentions.
3. Cornell University (New York): A controlled study is being conducted of the effectiveness of an agricultural hazard abatement and training program. The study involved dairy farms, site audits and training, and financial incentives to achieve desired improvements. Controls included both non-selected farms, plus those who refused to participate.
4. North Carolina A & T University: This project used several educational strategies to reduce illnesses and injuries among lower income farmers in selected districts. Farm surveys will be done to determine injury rates and problem areas. The project included a media campaign, school educational material development, and safety demonstrations.
5. Ohio State University: This was a randomized controlled study of the effect of an intensive safety program in agricultural businesses which involves focus groups and subsequent directed safety training. Assessment were made using worker questionnaires, selected site safety audits, and workers' compensations injury data.
6. University of Wisconsin-Madison: Structural and process interventions to improve both safety and profitability were evaluated in up to 900 dairy farmers, initially using pilot studies, and then disseminating the information to all potential users. The study used questionnaires to assess the success and reasons for non-adoption of interventions by individual farms.

### **Outputs:**

*Peer reviewed:*

Chapman LJ, Taveria AD, Josefsson KG and Hard DL. 2003. Evaluation of an occupational injury intervention among Wisconsin dairy farmers. Journal of Agricultural Safety and Health, 9(3): 197-209.

Joeseffsson KG, Chapman LJ, Taveira AD, Holmes BJ and Hard DL. 2001. A hazard analysis of three silage storage methods for dairy cattle. Human and Ecological Risk Assessment. 7(7):1895-1908.

Landsittel D, Murphy DJ, Kiernan NE, Hard DL, Kassab,C. 2001. An evaluation of the effectiveness of educational interventions in the Pennsylvania Central Region farm safety pilot project. American Journal of Industrial Medicine, 40(2):145-152.

Hard D, Wilkinson T, Knobloch M and Lancaster M. 1998. Rural Health: Farm Watch. National Edition Health Scene: Journal of Wellness and Good Health Care, Jan./Feb., pp. 4

Hard DL, Myers JR, Snyder KA, Casini VJ, Morton LL, Cianfrocco R and Fields J. 1999. Identifying work-related fatalities in the agricultural production sector using two national occupational fatality surveillance systems, 1990-1995. Journal of Agricultural Safety and Health, 5(2):155-169.

Murphy DJ, Kiernan NE, Hard DL and Landsittel D. 1998. The Pennsylvania Central Region farm safety pilot project: Part I--Rationale and baseline results. Journal of Agricultural Safety and Health, 4(1):25-41.

Landsittel D, Hard DL, Murphy DJ and Kiernan NE. 1998. The Pennsylvania Central Region Farm Safety Pilot project: Part II--Baseline data associations between approach-to-safety and hazard conditions. Journal of Agricultural Safety and Health, Special Issue 1: 21-28.

Hard DL, Myers JR, Fosbroke DE, Jenkins EL & Bender TR. The agricultural health promotion system: its use in building state-based agricultural safety and health infrastructures for developing a national model. Supplement to Agricultural Health and Safety: Workplace, Environment, Sustainability, pp. 243-247. Lewis Publishers, Chelsea, Michigan, 1994.

Jenkins EL & Hard DL. 1992. Implications for the use of E codes of the International Classification of Diseases and narrative data in identifying tractor-related deaths in agriculture, United States, 1980--1986. The Scandinavian Journal of Work, Environment and Health, Volume 18, Supplement 2, pp. 49-50.

Hard DL, Myers JR, Stout NS, & Pizatella TJ. 1992. A model agricultural health promotion systems program for building state-based agricultural safety and health infrastructures. The Scandinavian Journal of Work, Environment and Health, Volume 18, Supplement 2, pp. 46-48.

*Books Chapters, NIOSH Publications:*

Myers ML, Herrick RF, Olenchock SA, Myers JR, Parker JE, Hard DL and Wilson K (editors). 1992. Papers and Proceedings of the Surgeon General's Conference on Agricultural Safety and Health [645 pages], PL 101-517. NIOSH, US Department of Health and Human Services,

Centers for Disease Control, September, 1992. GPO number 017-033-00463-3 or NTIS number PB 93-114890.

Hard D. 1997. Fourth edition of the International Labour Offices' Encyclopaedia of Occupational Health and Safety. Volume 3, Part IV: Industries and Occupations, in Chapter *Livestock and Rearing*, Myers M, editor, article *Animal Behaviour*, 70.14.

*Presentations:*

Aherin R, Hard D, and Murphy D. Should ASAE be involved in safety practice standards? Invited panel participant in a panel presentation of the pro's and con's of ASAE involvement in developing safety practice standards. Sponsored by T-15 Ergonomics, Safety and Health committee at the 1996 Annual International meeting of the American Society of Agricultural Engineers. Phoenix, AZ.

Hard, D. Agricultural injuries in the US. Invited presentation at the conference on "Dangers in Agriculture: Injuries and Pesticide Exposure," on Feb. 4, 1994, Oregon Health Sciences University, Center for Research on Occupational and Environmental Toxicology.

Hard, D. State-based education programs in agricultural safety and health. Invited presentation as plenary speaker on at the NIOSH symposium on Agricultural Safety and Health: Detection, Prevention and Intervention, Columbus, OH, August 24/26, 1994.

Hard, D. Education as a Prevention Strategy. Invited session chair of session at the NIOSH Symposium on Agricultural Safety and Health: Detection, Prevention and Intervention, Columbus, OH, August 24/26, 1994.

Hard, D. Invited chair of the session on "Intervention" of the NIOSH Symposium on Efforts to Prevent Injury and Disease Among Agricultural Workers, August 25/27, 1993, Lexington, KY.

Hard D. 1992. Status of the NIOSH agricultural health promotion systems. National Institute for Farm Safety, Summer Conference, June 14-18.

Hard D and Green K. Co-chairs of "Rural Health Promotion" session of the Third International Symposium: Issues in Health, Safety, and Agriculture, May 10-15, 1992. Saskatoon, Saskatchewan, Canada.

Hard DL. The Agricultural Health Promotion System: Its use in building state-based agricultural safety and health infrastructures for developing a national model. Presentation on May 12, 1992. Third International Symposium: Issues in Health, Safety, and Agriculture, Saskatoon, Saskatchewan, Canada.

Hard DL, Myers JR, Stout NS & Pizatella TJ. A model agricultural health promotion systems program for building state-based agricultural safety and health infrastructures. Presentation on June 11, 1992 at the Fifth U.S.-Finnish Joint Symposium on Occupational Safety and Health. June 9-12, 1992. Cincinnati, Ohio.

Hard DL, Olenchock S, Bender TR, Fraizer T & Myers J. 1990. The agricultural safety and health initiative - What is it? The National Institute for Farm Safety, Las Vegas, Nevada.

#### Posters:

Hard DL. The Agricultural Safety Promotion System (ASPS). Poster presentation at the NIOSH Agricultural Health and Safety Conference, July 15-17, 1997. Morgantown, WV.

Hard DL, Pizatella T, Stout N and Linn H. The NIOSH Agriculture Research Program in the Division of Safety Research. Poster presentation at the NIOSH Agricultural Health and Safety Conference, July 15-17, 1997. Morgantown, WV.

Murphy DJ, Kiernan NE, Hard DL and Landsittel D. Pennsylvania Central Region Farm Safety Pilot Project: Audit Form Development. Poster presentation at the NIOSH Agricultural Health and Safety Conference, July 15-17, 1997. Morgantown, WV.

Chapman LJ, Purschwitz MA, Joeseffson KG, Taveira AD, Arndt RH, Schuler RT, Holmes BJ, Reinemann DJ, Smith TR and Hard DL. Higher Profitability and a Better Place to Work on Wisconsin Dairy Farms. Poster presentation at the NIOSH Agricultural Health and Safety Conference, July 15-17, 1997. Morgantown, WV.

Morton LL, Snyder KA, Hard DL, Bean TL, Lawrence TJ and Jepsen SD. A Method of Partnering for Evaluating Educational Materials. Poster presentation at the Agricultural Safety and Health: Detection, Prevention & Intervention symposium, August 24/26, 1994. Columbus, Ohio.

Hard D, Cutlip P, Stout N, Jenkins L, Kisner S & Cianfrocco R. (1991, April). Worker Fatalities Identified by Irrigation Key-Word Searches of the NTOF Data Base. Poster presentation at the Surgeon General's Conference on Agricultural Safety and Health, Des Moines, Iowa.

Hard DL, Myers J, Stout N, & Pizatella T. (1991, April). Building State-Based Agricultural Safety and Health Infrastructures: A Model Agriculture Health Promotions System Program. Poster presentation at the Surgeon General's Conference on Agricultural Safety and Health, Des Moines, Iowa.

Hard D, Myers J, Stout N, & Pizatella T. (1991, April). State-Based Agriculture Health Promotion System Programs. Poster presentation at the Third National Injury Control Conference, Denver, Colorado.

#### **Intermediate Outcomes:**

The University of California project resulted in a new nursery pot carrier system that reduced musculoskeletal injuries to nursery workers. The project had all intervention sites using the developed nursery pot handles. The project involved the workers in identifying the most strenuous tasks and in making suggestions for improvement to the designs. The CA project developed nursery pot handles which lowered the ergonomic risk associated with nursery pot

handling. The handles reduced workers' ergonomic risks by about 50%. They were later adopted and sold on the market by a national third party vendor.

The Missouri project, Missouri Training of Agricultural Safety to Kids (MOTASK), became the basis of a national program later adopted by the National FFA for their Partners for Safer Communities. It was a million dollar program, funded by private agribusiness, and implemented across the US by FFA chapters.

The Cornell University New York Agricultural Hazard Assessment Tool (NY AHAT) project demonstrated farmers will voluntarily correct hazards if it would reduce worker compensation claims. This program is still running in New York and has been adopted by the state worker compensation board.

The Ohio State University program still exists as educational training for farmers and workers. It is utilized for reducing worker compensation costs in the state of Ohio.

The University of Wisconsin concept of introducing and promoting interventions which have profitability and safety benefits to farmers proved to be of value to Dairy farmers. It was taken to a new group of farmers, fresh vegetable producers, under a different funding program.

**End Outcomes:**

None given.

**External Factors:**

What outside influences either enhanced or inhibited success of the program?

To what extent did the external factors contribute to the success or failure of the program?

**Future Directions:**

The ASPS program was ended in Fiscal Year 1997, due in large part to the recommendations of the 1995 Kennedy Report. The thrust of the NIOSH Agriculture Initiative was concentrating on expanding and increasing the NIOSH Agricultural Research Center program. There is no plan at this time to revisit the use this approach to develop and evaluate injury prevention methods for the agriculture production industry.